

Appl. No.: 10/029,709
Amdt. dated: November 30, 2007

26. (Previously canceled)
27. (Previously canceled)
28. (Previously canceled)
29. (Previously canceled)
30. (Currently amended) A dual loop synchronization system comprising:
a phase lock loop (PLL) having a phase/frequency detector (PFD), a voltage controlled oscillator (VCO), and a phase shifter coupled to said VCO configured in a feedback loop with said PFD, and receiving a local reference clock signal;
a first-in first-out (FIFO) register receiving a parallel data input;
a write counter receiving a write clock signal and providing an output to said FIFO register;
a read counter receiving a read clock signal and providing an output to said FIFO register;
a comparison module receiving output signals from both said write counter and said read counter to generate the fill level; ^{of said FIFO register} and
a delayed lock loop (DLL) having a detector coupled to the output of said FIFO register for detecting the fill level of said FIFO and a digital loop filter coupled between said detector and said phase shifter of said PLL to produce a phase shift in said PLL. ^{the phase shifter of}
31. (Previously presented) A dual loop synchronization system as in claim 30, wherein said PLL is embedded within the DLL:
32. (Currently amended) A dual loop synchronization system as in claim 30, wherein said detector coupled to the output of said FIFO register for detecting the fill level of said FIFO register is a phase detector.

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33. (Currently amended) A dual loop synchronization system as in claim 32, wherein said ^{phase} detector coupled to the output of said FIFO register for detecting the fill level of said FIFO register is a binary phase detector.
34. (Canceled)
35. (Previously presented) A dual loop synchronization system as in claim 30, wherein said PLL further comprises:
a loop filter coupled between said PFD and said VCO.
36. (Currently amended) A dual loop synchronization system as in claim 35, wherein the loop filter coupled between said said PFD and said VCO is configured as a wide bandwidth loop for suppressing VCO phase noise.
37. (Currently amended) A dual loop synchronization system as in claim 30, wherein said digital loop filter coupled between said detector and said phase shifter of said PLL to produce ~~the~~ ^{the phase shifter of} phase shift in said ~~PLL~~ PLL is a narrow bandwidth filter.
38. (Canceled)
39. (Canceled)
40. (Canceled)
41. (Currently amended) A method for data synchronization in a plesiochronous system comprising the steps of:
receiving write data in a first-in first-out (FIFO) register;
detecting the fill level of the FIFO register at the input of a delay locked loop (DLL);

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providing a signal based on the detected fill level to a phase lock loop (PLL);

receiving a local reference clock signal in the PLL;

shifting the phase of the local reference clock signal in the PLL in response to the signal based on the detected fill level provided by the DLL.

42. (Currently amended) A method for data synchronization in a plesiochronous system as in claim ~~40~~ 41, further comprising:

filtering the signal based on the detected fill level in the DLL before providing it to the PLL.

43. (Currently amended) A method for data synchronization in a plesiochronous system as in claim 42, wherein the step of filtering is performed with in a narrow bandwidth filter.

44. (Currently amended) A method for data synchronization in a plesiochronous system as in claim ~~40~~ 41, wherein in the step of receiving a the local reference clock signal in the PLL, the local reference clock is received at a phase/frequency detector in the PLL and further comprising:

filtering a signal at the output of the phase/frequency detector in a loop filter; and

providing the output of the loop filter to a VCO.

45. (Previously presented) A method for data synchronization in a plesiochronous system as in claim 44, wherein the step of filtering is performed in a wide bandwidth filter.

46. (New) A dual loop synchronization system comprising:

a phase lock loop (PLL) having a phase/frequency detector (PFD), a voltage controlled oscillator (VCO), and a phase shifter coupled to said VCO

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configured in a feedback loop with said PFD, and receiving a local reference clock signal;

a first-in first-out (FIFO) register receiving a parallel data input;

a write counter receiving a write clock signal and providing an output to said FIFO register;

a read counter receiving a read clock signal and providing an output to said FIFO register;

a reset counter receiving input signals from both said write counter and said read counter;

a register receiving input signals from both said reset counter and said read counter to generate the fill level; ^{of said FIFO register} and

a delayed lock loop (DLL) having a detector coupled to the output of said FIFO register for detecting the fill level of said FIFO and a digital loop filter coupled between said detector and said phase shifter of said PLL to produce a phase shift in said PLL. ^{the phase shifter of}

47. (New) A dual loop synchronization system comprising:

a phase lock loop (PLL) having a phase/frequency detector (PFD), a voltage controlled oscillator (VCO), and a phase shifter coupled to said VCO configured in a feedback loop with said PFD, and receiving a local reference clock signal;

a first-in first-out (FIFO) register receiving a parallel data input;

a write counter receiving a write clock signal and providing an output to said FIFO register;

a read counter receiving a read clock signal and providing an output to said FIFO register;

a binary decoder;

a plurality of phase detectors receiving input signals from both said write counter and said read counter and providing output signals to said binary decoder to generate the fill level; ^{of said FIFO register} and

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a delayed lock loop (DLL) having a detector coupled to the output of said
FIFO register for detecting the fill level of said FIFO and a digital loop filter
coupled between said detector and said phase shifter of said PLL to produce
a phase shift in said PLL. ^{the phase shifter of}
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